

**OPTIMIZATION OF INSULATED SANDWICH PANEL CORE FROM
EMPTY FRUIT BUNCH**

By

Lidia Dwi Putri
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SWISS GERMAN UNIVERSITY

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SWISS GERMAN UNIVERSITY
The Prominence Tower
Jalan Jalur Sutera Barat No. 15, Alam Sutera
Tangerang, Banten 15143 - Indonesia

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

Lidia Dwi Putri

Student

Date

Approved by:

Dr. -Ing. Evita Herawati Legowo

Thesis Advisor

Date

Ir. Paulus Gunawan, MM

Thesis Co-Advisor

Date

Dr. Dipl. -Ing. Samuel P. Kusumocahyo

Dean

Date

Lidia Dwi Putri

ABSTRACT

**OPTIMIZATION OF INSULATED SANDWICH PANEL CORE
FROM EMPTY FRUIT BUNCH**

By

Lidia Dwi Putri
Dr. –Ing. Evita H. Legowo
Ir. Paulus Gunawan MM

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Indonesia as the largest producer of palm oil, produced 35 million tons in 2016. The increasing demand consequently generates huge amount of Empty Fruit Bunch (EFB) as the main solid waste. So far, EFB has been utilized for fertilizer. However, EFB consist of high fibre content which exhibit low thermal conductivity that provide a suitable condition for the core replacement of insulated sandwich panel. Therefore, the research objectives were to identify the suitable EFB fibre size, adhesive concentration, thermal conductivity of EFB sandwich panel and internal condensation inside the panel. This research experiment consists of shredding, milling, refining and drying of EFB, as well as forming and covering process of core panel. PVC based adhesive was chosen as the adhesive used in this experiment. The thermal conductivity and the internal condensation of sandwich panel were conducted in a steady state heat transfer in a glass container. Based on the experiment, shredded EFB fibre indicates better performance than milled EFB fibre. Higher concentration of PVC based adhesive is preferred to formed a compact core panel and exhibit low thermal conductivity. The result shows that the thermal conductivity value of all samples are in the same range with the reference and no internal condensation inside the sandwich panel.

Keywords: Crude Palm Oil Waste, Empty Fruit Bunch, Polyvinyl Chloride, Insulated Sandwich Panel, Thermal Conductivity.



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DEDICATION

I dedicate this works first and foremost to myself.

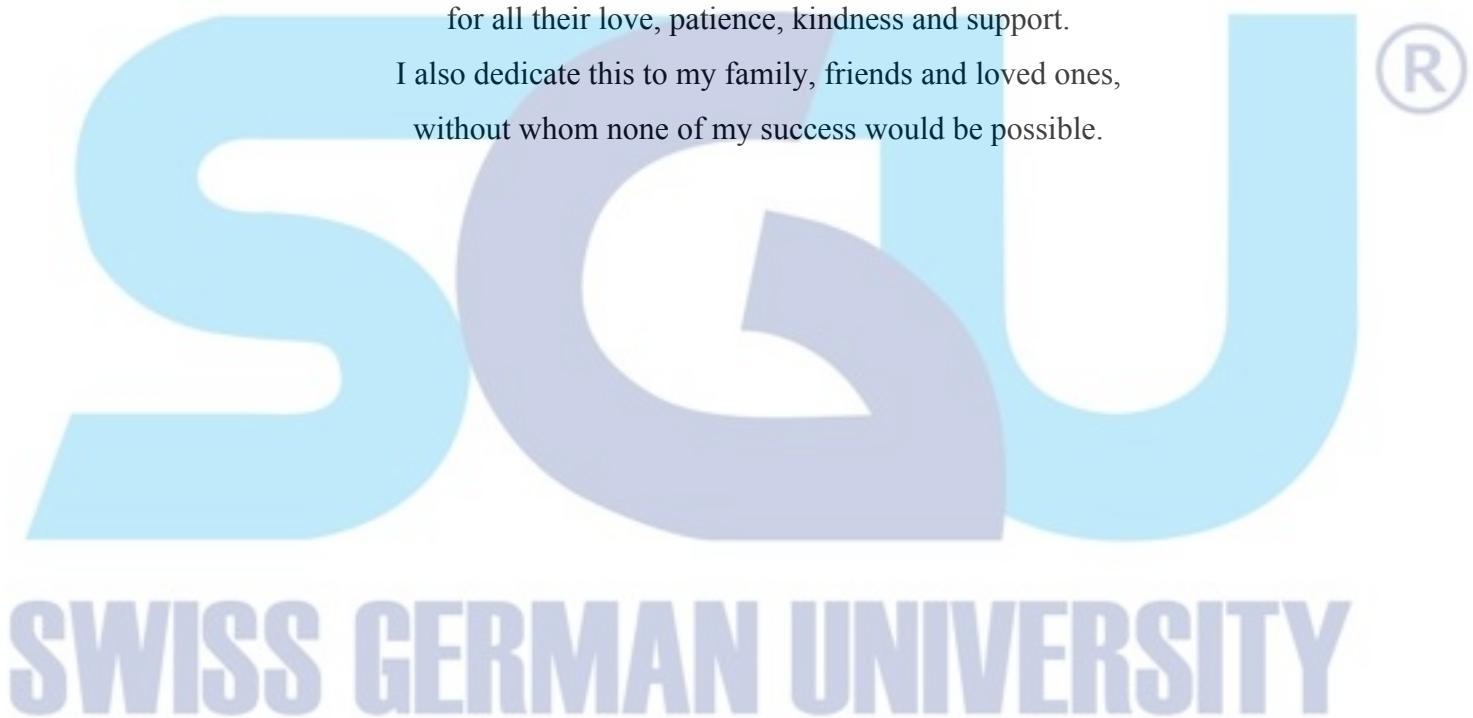
To my wonderful moms,

Yuliana Fransiska and Melly Linawaty,

for all their love, patience, kindness and support.

I also dedicate this to my family, friends and loved ones,

without whom none of my success would be possible.



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